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(19) **United States**(12) **Patent Application Publication**  
**WILK et al.**(10) **Pub. No.: US 2021/0120344 A1**(43) **Pub. Date: Apr. 22, 2021**(54) **ELECTRO-ACOUSTIC TRANSDUCER  
DIAPHRAGM WITH INTEGRATED  
STRUCTURAL FEATURES, AND RELATED  
SYSTEMS AND METHODS**(71) Applicant: **Apple Inc.**, Cupertino, CA (US)(72) Inventors: **Christopher WILK**, Los Gatos, CA  
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**ABSTRACT**

An electro-acoustic transducer has an acoustic diaphragm and a voice-coil. The diaphragm defines a first major surface. A flange extends from the diaphragm in a direction opposite the first major surface. The voice-coil has a first plurality of windings positioned adjacent to the acoustic diaphragm and a second plurality of windings positioned distally from the acoustic diaphragm. The flange overlaps the first plurality of windings. The flange and the windings can be adhesively bonded with each other to form a lap joint. The lap joint can transfer force from the voice-coil to the diaphragm.

